AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electronic control apparatus which incorporates a floating-point arithmetic function and performs ~~various types of~~ calculation and control operations in accordance with a predetermined computer program, ~~comprising~~ said apparatus comprising:

conversion means ~~for operating~~ adapted to operate on map data that comprise a set of map points and a set of map values respectively corresponding to said map points, and to convert at least one of said set of map points and set of map values from fixed-point representation to floating-point representation data, wherein:

said at least one of said set of map points and set of map values indirectly represent respective values of a physical quantity;

said conversion means comprises means for providing a LSB (least significant bit) conversion value as a floating-point representation value which directly represents a specific value of said physical quantity, with said specific physical quantity value having been predetermined as corresponding to a LSB (least significant bit) of said at least one of the set of map points and set of map values; and

said conversion means is adapted to operate on said floating-point representation converted data with said LSB conversion value, to obtain a floating-point representation calculated value of said physical quantity and to output said calculated value.

2. (Currently Amended) An electronic control apparatus according to claim 1, ~~wherein~~ wherein:

said map points are expressed in floating-point representation in said map data and said map values are expressed in fixed-point representation in said map data, and ~~wherein~~

data expressing said set of map values are of smaller amount that data which express said set of map points.

3. (Currently Amended) An electronic control apparatus according to claim 1, ~~wherein~~ wherein:

said map points are expressed in fixed-point representation in said map data and said map values are expressed in floating-point representation in said map data, and ~~wherein~~

data expressing said set of map values are of greater amount than data which express said set of map points.

4. (Currently Amended) An electronic control apparatus according to claim 1, ~~wherein~~ wherein:

said map data and said map values are both expressed in fixed-point representation in said map data, and ~~wherein~~

said conversion means performs conversion of both said map points and said map values from fixed-point representation to floating-point representation.

5. (Currently Amended) An electronic control apparatus according to ~~claim 3~~ claim 2 wherein ~~said map values indirectly express respective physical quantity values, and comprising means for providing a LSB conversion value that is expressed in floating-point representation and represents a physical quantity value that has been predetermined as corresponding to a least significant bit of said fixed-point representation data, wherein~~ wherein:

said map conversion means ~~generates floating-point data expressing a value of a physical quantity corresponding to an interpolated value of said map values~~ is adapted to convert a selected pair of said map values to floating-point representation and calculate an interpolated value of said floating-point representation pair of map values, and to generate floating-point data expressing said calculated value of the physical quantity by using said ~~data converted to floating-point representation~~ interpolated value in conjunction with said LSB conversion value.

6. (Currently Amended) An electronic control apparatus according to claim 5 wherein said conversion means ~~derives~~ is adapted to derive said floating-point representation ~~value of a~~ calculated value of said physical quantity ~~corresponding to an interpolated value of said map values~~, by ~~successively~~ successively:

operating on said converted floating-point representation data expressing said selected pair of map values to calculate ~~an~~ said interpolated value ~~of said map values~~, and

~~using said LSB conversion value to operate on~~ multiplying said interpolated value by said LSB conversion value, to obtain said floating-point representation calculated value of said physical quantity ~~value corresponding to said interpolated value~~.

7. (Currently Amended) An electronic control apparatus according to claim 6 comprising means ~~for providing~~ adapted to provide data expressing an offset value that has been predetermined as corresponding to said map data, wherein said interpolated value is obtained as a logical value, and wherein conversion means is adapted to:

~~operates~~ operate on said logical value with said LSB conversion value, to obtain a provisional value of said calculated value of said physical quantity ~~corresponding to said interpolated value~~, and

~~adds~~ add said offset value to said provisional value, to obtain said floating-point representation calculated value of [[a]]said physical quantity ~~corresponding to said interpolated value~~.

8. (Currently Amended) An electronic control apparatus according to claim 3, ~~comprising means for providing a LSB conversion value that is expressed in floating-point representation and represents a physical quantity value that has been predetermined as corresponding to a least significant bit of said fixed-point representation data,~~ wherein said LSB conversion ~~means utilizes said~~ value corresponds to a LSB (least significant bit) of said set of map points and wherein said conversion means is adapted to convert ~~conversion value and~~ said map ~~value data converted~~ points to floating-point representation map point data and to operate on said floating-point representation map point data with said LSB conversion value to obtain said calculated ~~to obtain a~~ physical quantity value ~~corresponding to said map point data and~~ expressed in floating-point representation.

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9. (Currently Amended) An electronic control apparatus according to claim 8, comprising means ~~for providing~~ adapted to provide data expressing an offset value that has been predetermined as corresponding to said map data, wherein said conversion means obtains said interpolated value as a logical value, and wherein conversion ~~means~~ means:

operates on said interpolated value with said LSB conversion value, to obtain a provisional value of said calculated physical quantity value ~~corresponding to said interpolated value~~, and

adds said offset value to said provisional value, to obtain said floating-point representation calculated value of [[a]] said physical quantity ~~corresponding to said interpolated value~~.

10. (Currently Amended) An electronic control apparatus according to claim 1, ~~comprising~~ further comprising:

means for providing ID (identifier) data which express a type of said fixed-point representation data,

wherein said conversion means performs conversion of said floating-point representation data to said fixed-point representation data based on said ID data.

11. (Original) An electronic control apparatus according to claim 1, wherein said conversion means executes said conversion by using a program that is written in assembler language.

12. (Currently Amended) An electronic control apparatus according to claim 1, ~~comprising~~ comprising:

means for providing ID (identifier) data which have been predetermined as corresponding to said map data and which indicate whether or not both said map points and said map values of said map data are expressed in floating-point representation, and

means for inhibiting said conversion operation of said conversion means when said ID data indicate that both said map points and said map values are expressed in floating-point representation.

13. (Currently Amended) A memory apparatus for an electronic control apparatus, said electronic control apparatus executing ~~various types of~~ calculation and control processing in accordance with a predetermined program and having a floating-point arithmetic function, and said memory apparatus having stored therein map data which are used in floating-point calculations, said memory apparatus comprising:

~~wherein~~ a digital store containing said map data ~~include~~ including a set of map points and a set of map values that respectively correspond to said map points, with at least one of said set of map points and said set of map values being expressed by fixed-point representation data, and

means for outputting a calculated value representing a physical quantity,

wherein said memory apparatus has stored therein, in conjunction with said map data, a LSB (least significant bit) conversion value that is expressed in floating-point representation and represents a physical quantity value that has been predetermined as corresponding to a least significant bit of said fixed-point representation data.

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14. (Currently Amended) A memory apparatus for an electronic control apparatus according to claim 13 ~~wherein~~ wherein:

said memory apparatus has stored therein, in conjunction with said map data, an offset value that is a difference between a physical quantity value and a value that has been generated by converting said fixed-point representation data to floating-point representation data and using said LSB conversion value to operate on a result of ~~an interpolation~~ a calculation performed on said converted floating-point representation data.

15. (Currently Amended) A memory apparatus for an electronic control apparatus according to claim 13, ~~wherein~~ wherein:

said memory apparatus has stored therein, in conjunction with said map data, ID (identifier) data indicative of a type of said fixed-point representation data.

16. (Currently Amended) A memory apparatus for an electronic control apparatus according to claim 13, ~~wherein~~ wherein:

said memory apparatus has stored therein said map data with both said map points and said map values being expressed by floating-point representation data and further has stored therein, in conjunction with said map data, ID (identifier) data indicative of the condition that said map points and map values are both expressed in floating-point representation data.

17. (New) An electronic control apparatus which incorporates a floating-point arithmetic function and performs various types of calculation and control operations in accordance with a predetermined computer program, ~~comprising~~ said apparatus comprising:

a memory having stored therein map data that comprise a set of map points that are expressed in fixed-point representation and a set of map values respectively corresponding to said map points and expressed in floating-point representation, and

means for outputting a calculated value representing a physical quantity,

wherein:

said set of map points indirectly represent respective values of a physical quantity; and

said conversion means comprises means for providing a LSB (least significant bit) conversion value expressed in floating-point representation, directly representing a value of said physical quantity that has been predetermined as corresponding to a LSB of said set of map points; and

said conversion means is adapted to convert at least one of said map points to floating-point representation and to operate on said floating-point representation converted map point with said LSB conversion value, to obtain a calculated value of said physical quantity in floating-point representation.

18. (New) An electronic control apparatus according to claim 17, further comprising:

means for providing data expressing an offset value that has been predetermined as corresponding to said map data,

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wherein said conversion means obtains said interpolated value as a logical value, and

wherein said conversion means is adapted to:

multiply said interpolated value by said LSB conversion value, to obtain a

provisional value of said calculated physical quantity; and

add said offset value to said provisional value, to obtain said floating-point

representation calculated value of said physical quantity.

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